Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A system for diagnostically evaluating the health of tissue within the fundus of an eye, which comprises:

a laser source for generating a laser beam, said laser beam having a plurality of laser pulses, wherein each laser pulse has a first wavelength and a pulse duration less than approximately two hundred femtoseconds;

an optical assembly for focusing each laser pulse to a focal point in the fundus, with the focal point being characterized by a spot size having a diameter of approximately two microns, wherein the laser pulses of the first wavelength illuminate tissue to induce a second harmonic generation (SHG) response of a second wavelength, by photon conversion, when the laser beam is incident on anisotropic tissue in the fundus, with said SHG response ~~having a~~ of the second wavelength [[and]] being used to create an image;

a means for detecting the SHG response; and

a computer for evaluating the image of the SHG response in comparison with a template for healthy tissue to determine the health of the fundus tissue.

2. (Original) A system as recited in claim 1 wherein said first wavelength is in the range between 700 nm to 1000 nm, and further wherein said second wavelength is in the range between 350 nm to 500 nm.

3. (Original) A system as recited in claim 2 wherein said first wavelength is 880 nm.

4. (Original) A system as recited in claim 1 wherein a pulse of said laser beam has an energy level of 1nJ.

5. (Original) A system as recited in claim 1 wherein said optical assembly includes adaptive optics.

6. (Original) A system as recited in claim 5 wherein said optical assembly further comprises:

an active mirror;

a scanning unit for periodically moving said laser beam from one focal point to an adjacent focal point in the fundus, to focus said laser beam on a plurality of focal points within said fundus;

two focusing lenses;

a wavefront sensor for generating data indicative of an alignment of the eye; and

a computer for receiving the data from said wavefront sensor for use in controlling said active mirror to direct said laser beam to the focal point.

7. (Original) A system as recited in claim 1 wherein said laser beam irradiates a focal point with about five laser pulses.

8. (Original) A system as recited in claim 1 wherein said detecting means comprises an imaging unit in electronic communication with a computer.

9. (Previously Presented) A system as recited in claim 1 wherein said evaluating means uses a pattern of the SHG response to evaluate the health of the fundus tissue.

10. (Previously Presented) A system as recited in claim 1 wherein said evaluating means compares an intensity level of said SHG response to a predetermined threshold value of light intensity to evaluate the health of the fundus tissue.

11. (Previously Presented) A system as recited in claim 1 wherein the SHG response includes a plurality of responses, and further wherein said evaluating means counts the number of SHG responses to evaluate the health of the fundus tissue.

12. (Currently Amended) A method for diagnostically evaluating the health of tissue within the fundus of an eye which comprises the steps of:

dilating the iris of the human eye to create an aperture having an extended diameter;

directing a laser beam generated by a laser source through said aperture to a focal point in said fundus of said eye, said laser beam having a plurality of laser pulses, wherein each laser pulse has a first wavelength and a pulse duration less than approximately two hundred femtoseconds;

scanning said focal point between anisotropic tissue and isotropic tissue in said fundus;

inducing photon conversion with the laser pulses of the first wavelength generated by the laser source, when said focal point is directed at anisotropic tissue to generate a return light from the tissue, wherein the return light is a second harmonic generation (SHG) response having a second wavelength;

absorbing the laser beam when said focal point is directed at isotropic tissue;

detecting the return light having a second wavelength generated by anisotropic tissue to create an image;

detecting the absorption of the laser beam by isotropic tissue; and

evaluating the image created by the return light in comparison with a template to determine the health of the fundus tissue.

13. (Original) A method as recited in claim 12 wherein said extended diameter is approximately six millimeters (6mm).

14. (Original) A method as recited in claim 12 wherein the energy level of said laser pulse is 1nJ.

15. (Original) A method as recited in claim 12 wherein said first wavelength is in the range between 700 nm to 1000 nm, and further wherein said second wavelength is in the range between 350 nm to 500 nm.

16. (Original) A method as recited in claim 15 wherein said first wavelength is 880 nm.

17. (Previously Presented) A method as recited in claim 12 wherein said directing step further comprises the steps of:

programming an active mirror to compensate said laser beam;

reflecting said laser beam off said active mirror to direct said laser beam through a scanning unit and at least two focusing lenses; and

periodically moving said laser beam from one focal point to an adjacent focal point in the fundus during the scanning step, to focus said laser beam on a plurality of focal points within said fundus.

18. (Original) A method as recited in claim 17 which further comprises the step of receiving data indicative of an alignment of the eye from a wavefront sensor for programming said active mirror to direct said laser beam to the focal point.

19. (Original) A method as recited in claim 12 wherein said laser beam irradiates a focal point with about five laser pulses.

20. (Original) A method as recited in claim 12 wherein said evaluating step further comprises the steps of:

identifying a pattern of said return light; and

evaluating said pattern to determine the health of the fundus tissue.

21. (Original) A method as recited in claim 12 wherein said evaluating step further comprises the steps of:

quantifying the intensity level of said return light; and

comparing said intensity level to predetermined threshold levels of light intensity for determining the health of the fundus tissue.

22. (Original) A method as recited in claim 12 wherein said return light includes a plurality of responses, and further wherein said evaluating step further comprises the step of counting the number of return light responses for evaluating the health of the fundus tissue.

23. (Currently Amended) An apparatus for diagnostically evaluating the health of tissue within the fundus of an eye, which comprises:

a laser source for generating a laser beam, said laser beam having a plurality of laser pulses, wherein each laser pulse has a first wavelength and a pulse duration less than approximately two hundred femtoseconds;

an optical assembly for focusing each laser pulse to a focal point in the fundus, said focal point being characterized by a spot size having a diameter of approximately two microns, wherein the laser pulses <u>of the first wavelength illuminate tissue to</u> induce a second harmonic generation (SHG) response <u>of a second wavelength, by photon conversion,</u> when the laser beam is incident on anisotropic tissue in the fundus, with said SHG response having a second wavelength;

an imaging unit for detecting the SHG response as an image; and

a computer for evaluating the image created by said SHG response in comparison with a template to determine the health of said fundus tissue.

24. (Original) An apparatus as recited in claim 23 wherein said first wavelength is in the range between 700 nm to 1000 nm, and further wherein said second wavelength is in the range between 350 nm to 500 nm.

25. (Original) An apparatus as recited in claim 23 wherein said first wavelength is 880 nm.

26. (Original) An apparatus as recited in claim 23 wherein said optical assembly includes adaptive optics.

27. (Original) An apparatus as recited in claim 26 wherein said optical assembly further comprises:

an active mirror;

a scanning unit for periodically moving said laser beam from one focal point to an adjacent focal point in the fundus, to focus said laser beam on a plurality of focal points within said fundus;

two focusing lenses; and

a wavefront sensor for generating data indicative of an alignment of the eye for use in controlling said active mirror to direct said laser beam to the focal point.

28. (Original) An apparatus as recited in claim 23 wherein said laser beam irradiates a focal point with about five laser pulses.

29. (Original) An apparatus as recited in claim 23 wherein a pulse of said laser beam has an energy level of 1nJ.

30. (Previously Presented) An apparatus as recited in claim 23 which further comprises a means for evaluating a pattern of said SHG response to evaluate the health of the fundus tissue.

31. (Previously Presented) An apparatus as recited in claim 23 which further comprises a means for comparing an intensity level of said SHG response to predetermined threshold values of light intensity to evaluate the health of the fundus tissue.

32. (Previously Presented) An apparatus as recited in claim 23 wherein said SHG response includes a plurality of responses, and further wherein the apparatus includes a means for counting the number of SHG responses to evaluate the health of the fundus tissue.